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# THE LARYNGOSCOPE.

VOL. LVII

APRIL, 1947.

No. 4

## A NEW METHOD OF SCIENTIFIC INVESTIGATION OF THE INNER EAR.\*†

H. G. KOBRAK, M.D., Ph.D.,  
Chicago, Ill.

The anatomists divide the ear into three main parts: The outer ear, the middle ear and the inner ear. The physiologists distinguish between a sound conducting part and a sound perception system in the ear. The otologist of today seems to combine the two systems by identifying the outer and middle ear with the sound conducting system, while the inner ear is—in a similar, hazy way—used synonymously with the sound perception part.

It is easily seen that such a simplification is erroneous. It is true that the end-point of sound conduction is located in the inner ear; however, a number of inner ear structures are definitely a part of the sound conduction system.

Table 1 shows a list of anatomical structures located in the outer, middle and inner ear. All these structures are parts of the sound conduction system.

TABLE 1.

Auricle	Oval window
Outer ear canal	Intracochlear fluids
Eardrum	Basilar membrane
Ossicular chain	Round window membrane
Air of the middle ear cavity	

Each and every one of the structures shown in Table 1 has to be analyzed and studied as to its function as conveyor of

\*Read at the meeting of the Middle Section of the American Laryngological, Rhinological and Otological Society, Inc., Chicago, Ill., Jan. 20, 1947.

†From the Division of Otolaryngology of the University of Chicago.

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sound energy. This revised system of the sound conducting system is not presented here just to clarify the nomenclature; on the contrary, the development of otology during the last eight years has proven that our old conceptions and our previous knowledge of the inner ear were inadequate. The fenestration operation presents an experiment on sound conduction in the inner ear. It has raised a number of important physiological problems. On the other hand, it has made painfully evident the fact that available knowledge is inadequate to solve the physical-physiological problems which the operation has created. In retrospect we see today that the last decade has seen very intensive work on the surgical side of the problem. The location, size and shape of the opening, as well as the technique of the plastic coverage of the fistulae, were studied intensively. All investigators had chiefly one point in mind: the prevention of closure. This development is only natural. A surgeon conceived the operation, surgeons developed the technique further, otological clinicians and surgeons were the audience for the publications.

It seems necessary, however, to approach the entire complex of problems with additional research methods. It must be recognized that the inner ear presents a multitude of physical problems which must be comprehended, studied and solved before we can hope to master the problem of fenestration or any other inner ear dysfunction. Surgery and biophysics must march together.

This paper endeavors to describe some new methods to study the biophysics of the inner ear.

Our basic observation was made shortly before the war when we succeeded in seeing and photographing for the first time the acoustic vibrations in the ear.<sup>1</sup> It was shown in this initial observation that overthreshold tones produce amplitudes within the ear which are considerably larger than assumed from extrapolation of threshold amplitudes. For a loud tone of low frequency the vibrations of the eardrum and ossicular chain were found to be so large that they can be seen with the naked eye. With a relatively simple experimental setup consisting of proper magnification and strobo-

scopic illumination, moving picture films were taken of the ear during the process of hearing. Naturally, in the ear-normal person, only the eardrum can be observed.

In order to study the deeper parts of the ear, especially the inner ear, surgical exposures of the anatomical structures are necessary. Experimental work was done on animals and on fresh human cadaver ears. The feasibility of utilizing fresh cadaver specimens has been studied by various authors. It is the consensus of opinion that the elastic qualities of the eardrum and of the ligaments of the ear do not change immediately after death.<sup>2,3</sup>

We have used two methods to record the acoustic vibrations in the inner ear:

1. The moving picture film.
2. Optical recording by attachment of a small mirror.

The movie picture film is especially valuable because it represents the minimum interference with the delicate tissues. No recording instrument is brought in direct contact with the structures. The mass and elasticity conditions are unchanged. Once the phenomena are recorded by the movie camera, they can be repeatedly projected on the screen. Thus new details which may be overlooked in the initial observations may be seen. In addition, quantitative measurements of the amplitudes can be obtained by using a method which will be explained later.

The experimental problems of taking moving pictures of the inner ear can be classified as follows:

1. *Exposure of the cochlea:* This is mainly an anatomical problem. Minimum interference with the functionally important structures is attempted.
2. *Illumination:* A high level light intensity was used. Color temperature about 3400 K.
3. *Stroboscopic interruption:* A rotating disc with holes was used. Tuning between tone and stroboscopic was done by selecting the proper tone frequency.

4. *Heat absorption for protection of the biological object:* An oil containing cell was used for heat absorption.

5. *Immobilization of the object:* Respiratory and pulse movements cannot be avoided entirely in the animal experiment, but were minimized by proper technique.

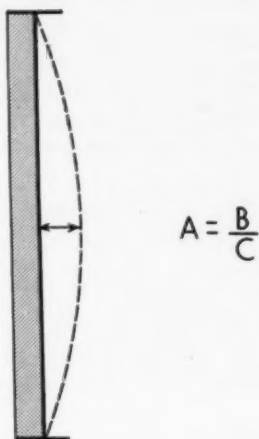
6. *Magnification:* An object to image ratio of 1:1 was used frequently. Details as small as  $1/20$  of 1 mm. can be demonstrated. Magnification in case of 1:1 object to image ratio is provided by the projection only. A 2-inch focal length projection lens as used frequently in projectors magnifies five times for persons seated near the projector (magnification expressed by the angle extended on the retina). Linear comparison of image on the screen to size of object varies with the distance between projector and screen. A magnification 200:1 was used frequently.

7. *Focusing:* The depth of focus is rather shallow when an object image ratio of 1:1 is used. Smaller ratios were used when greater depth was necessary because they have better depth of focus.

A very important structure of the inner ear which has been neglected in previous research is the round window membrane. Special emphasis has been placed in this paper on observing and measuring the elastic qualities of the round window membrane. In the cadaver ear, the round window was exposed and the movements photographed which occur due to pressure changes in the outer ear canal. Acoustic vibrations are made visible by stroboscopic illumination. For quantitative determinations, the following method was developed. The magnification of the optical system must be determined first. The size of a millimeter of the ruler on the projection screen is the magnification factor.

When measuring the amplitudes of a vibrating point, three possibilities have been distinguished. The first and easiest condition is that of profile exposure. This means the vibration takes place in the plane of the projection screen. The amplitude is measured on the screen. By dividing the meas-

ured value by the magnification factor the amplitude of the vibrating point in the ear is obtained (see Fig. 1).



### AMPLITUDE MEASUREMENT ON PROFILE EXPOSURE

A = AMPLITUDE

B = MEASURED DISPLACEMENT

C = OPTICAL MAGNIFICATION FACTOR

Fig. 1. Utilization of moving picture film for quantitative estimation of amplitude. A vibrating membrane is photographed under stroboscopic illumination. The center of the membrane vibrates in the plane of the projection screen (indicated by arrow). The film is projected very slowly (hand operated) and the amplitude traced on paper and measured. By dividing the measured displacement by the optical magnification factor, the amplitude is obtained.

The movements of intracochlear fluid in the opened cochlea (see Fig. 2) can be observed in the plane of the film.

A second condition is that the vibration occurs in a plane which extends an angle of  $45^\circ$  with the projection screen. Most measurements of the round window membrane were made under this arrangement. The specimen is placed so that

the central beam from the camera strikes the round window membrane at an angle of  $45^\circ$ . The estimate of the amplitude is explained in Fig. 3.

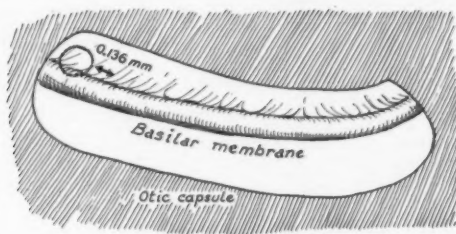


Fig. 2. Quantitative estimate of amplitude of fluid vibration in the cochlea. A hole is made in the wall of the promontory exposing the scala vestibuli of the basal coil. The fluid can be observed under the influence of a tone delivered to the external auditory canal. A paper tracing is made of the photographed fluid particle. The vibrations vary with the frequency and intensity of the tone. The maximum amplitude observed in this specimen is 1.5 microns. The actual amplitude of the vibration is determined by dividing the enlarged amplitude by the magnification factor.

The third and least desirable condition exists when the vibrating point forms a sharp angle to the beam. In this case the amplitude of the vibrating point is the measured ampli-

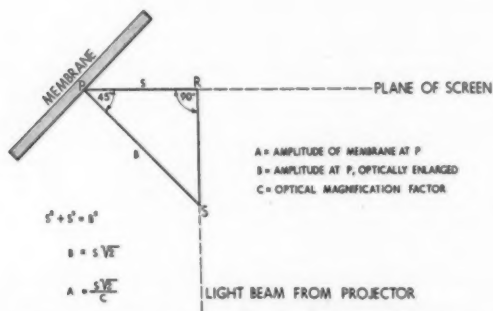


Fig. 3. Same as Fig. 1, but vibrating point oscillates in a plane which forms an angle of  $45^\circ$  with the plane of the screen. In this case the amplitude of P is projected onto the screen as S. By elementary trigonometry the real amplitude is shown to be  $S \times \sqrt{2}$  divided by the optical magnification factor.

Most observations of the round window membrane were taken under an angle of  $45^\circ$ .

tude divided by the product of the cosine of the angle and the magnification factor.

Measurements of the eardrum amplitudes seen from the outer ear canal are done with this formula.

The second method of optical recording consists in attaching a very small mirror onto the vibrating part. We used galvanometer mirrors which are about 0.03 inch long and 0.015 inch wide and weigh about 10 to 11 mg. Such a mirror was placed on the round window membrane. The membrane was studied *in situ* or after extirpation.

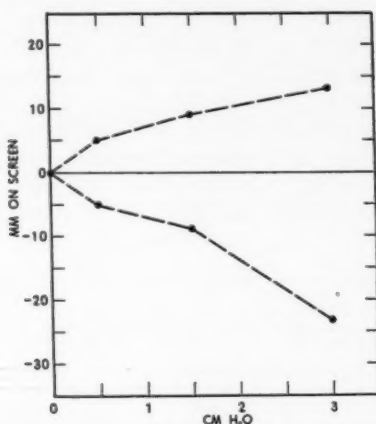


Fig. 4. Static force—deflection curve of round window membrane *in situ*. A very small mirror was attached to the round window membrane on its tympanic side. Static pressure changes were produced in the external auditory meatus. The deflections of the mirror were measured on a screen.

Note: The deflection by negative pressures are stronger than those by positive pressures.

The amplitudes of the round window membrane were measured either by quantitative exploitation of the movie film or by optical mirror recording, thus the first curves of the elastic conditions of the round window membrane were obtained (see Figs. 4 and 5).

The observation of the round window membrane during sound conduction is useful for the realization of an old

experimental problem of cochlear physiology. The moving picture film enables us to observe the vibrations of the cochlea without opening or even touching the structure. In comparing this new method with the old manometry of the inner ear as used many years ago by Politzer, Bezold and others, two advantages are evident.

1. The classical method consisted in inserting glass capillaries into the inner ear. Capillaries cannot be used for

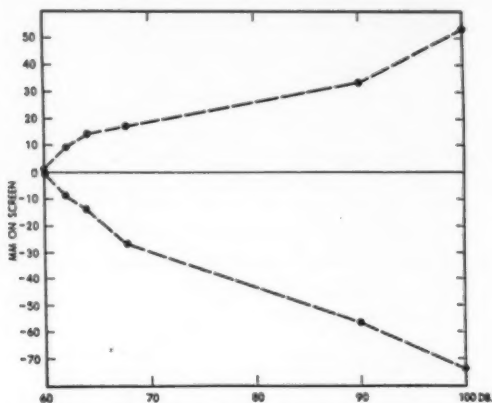


Fig. 5. Acoustic force—deflection curve of round window membrane.

Method identical as in Fig. 4. Instead of static pressure changes, a tone of 256 d.v. was applied in the outer ear.

Note: The deflection by the negative phase of the sound wave is greater than by the positive component.

audio frequencies. Only static pressure measurements could be carried out with that method.

2. The insertion of the capillary necessitated an opening in the otic capsule. Naturally the artificial opening resulted in loss of fluid, perhaps collapsing of some membranous structures within the cochlea. With our method no change of mass or elasticity occur during the optical recording by the camera. In the moving picture film is demonstrated how the round window membrane can be used as a "dynamic manometer"



of the cochlea. The vibrations of the round window membrane during the playing of music is shown in the film.

#### SUMMARY.

Acoustic stimuli were conveyed into the outer ear of fresh human cadaver specimens. The objective response of the ear to sound is observed and measured by optical recording. Two methods of optical recording are described. 1. The moving picture film. 2. Optical recording by attaching small mirrors to the vibrating structure. The moving picture is advantageous because no recording instrument is brought in direct contact with the structures. A method has been worked out by which quantitative estimates of the amplitudes of vibration are obtained. Movements of ossicles, stapes footplate, round window membrane and intralabyrinthine fluid were recorded. Phase differences are demonstrated. The utilization of the round window membrane as a "dynamic manometer of the cochlea" is discussed. The vibrations of the round window membrane caused by music is demonstrated in the moving picture film.

By attaching a small galvanometer mirror to the round window membrane the first elasticity curves of this elastic structure were obtained.

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#### AMERICAN BOARD OF OTOLARYNGOLOGY.

The American Board of Otolaryngology will conduct the following examinations in 1947:

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Address inquiries to Dean M. Lierle, M.D., Secretary-Treasurer, Iowa City, Iowa.

ACRYLIC RESIN IMPLANT FOR ATROPHIC  
RHINITIS (PRELIMINARY REPORT).\*

G. O'NEIL PROUD, M.D.,  
St. Louis, Mo.

Although more than 560 investigators have reported on atrophic rhinitis in the past 50 years, the etiology of this distressing malady remains as obscure today as it was at the turn of the century. The disease is prevalent among Latins and Orientals, is seen in Negroes of this country, but not in African Negroes. It tends to attack several members of one family and occurs more frequently in females than males. It is often referred to as a type of obliterative endarteritis, but it shows no predilection for heavy smokers or Russian Jews.

Most authorities recognize two types of this disease: the primary type usually begins in early childhood and may disappear at puberty or persist and increase in severity; the secondary type follows radical intranasal surgery or prolonged suppurative sinus disease. Massive intranasal crust formations serve to differentiate the disease from the simple atrophy of senility. Although a fetid odor known as ozena frequently accompanies atrophic rhinitis, it is only a symptom of the disease. The term ozena is used interchangeably with atrophic rhinitis in the literature. Externally, the nose of the person having atrophic rhinitis often is characterized by the presence of a thickened vestibular rim and a button-like tip.

In the past, the treatment of atrophic rhinitis has been no more successful than attempts to determine its cause. Conservative therapy has proven only palliative. Perez<sup>1</sup> prepared a vaccine from his "coccobacillus" and reported success in some instances from its use. Vitamins, estrogenic sprays, tamponade and ultraviolet irradiation all have had their

\*From Department of Otolaryngology, Washington University School of Medicine, St. Louis, Mo.

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vogue. Gritti<sup>2</sup> reported transient improvement in some patients following submucous injections of whole blood, but all symptoms recurred when the treatment was halted. In our clinic, three patients were so treated without even the temporary success reported by Gritti. Submucous paraffin injections were used by Gersuny,<sup>3</sup> but the results were poor and extrusion of the paraffin was all too frequent.

Several surgical procedures have been devised in an effort to narrow the nasal airway. Lautenschlager<sup>4</sup> approached the lateral nasal wall via the Caldwell-Luc route, mobilized it and fractured it medially. The procedure was radical, and its success depended upon the formation of multiple synechiae between the septum and the lateral nasal wall. Crusting was diminished in some instances, but the patient was unable to breathe normally through the nose and normal nasal physiology was destroyed. Halle's<sup>5</sup> modification offered a simpler intranasal approach for a similar end-result, but again all nasal function was deleted. Kasnetz<sup>6</sup> and Kemler<sup>7</sup> used ivory implants with some success. Bone, metal and glass implants also have been employed, but extrusion has been frequent.

The purpose of this work has been to devise a surgical method which would accomplish the following:

1. Diminution of the size of the nasal cavity.
2. Restoration of normal nasal physiology.

Widening the septum seemed to be the simplest procedure. The success in nearly all patients on whom septum widening procedures have been done has been striking, but the extrusion of the implants which were placed between the cartilage and the mucoperichondrium was nearly always followed by recurrence of symptoms. We believed that a septum widening operation which did not fail due to the extrusion of the implant or its absorption, as in cases where cartilage was used, should be an ideal procedure.

It must be borne in mind that the septal cartilage contains no lymphatics or blood vessels. Oxygen and nutritive substances are brought to its cells by diffusion of fluids from the

perichondrium. Waste is eliminated by diffusion through the ground substance in the opposite direction. Elevation of the mucoperichondrium and insertion of a foreign body (implant) between it and the cartilage immediately stops the flow of nutritive elements to the cartilage. An area containing such devitalized cartilage should provide a perfect medium for eventual extrusion of the implant.

#### MATERIALS.

In 1942, Gutierrez\* was the first to use acrylic resin as an inclusion between the perichondrium and the septal cartilage in the treatment of atrophic rhinitis. Methyl methacrylate was the material selected for this study because of its high tissue tolerance. From it, the septal implants were fashioned. This acrylic resin was easily shaped and cured with a minimum of time involved. Wax positives of the implant were fashioned first. These were embedded in plaster of paris and were removed by washing with hot water. After the plaster had hardened, the plastic was pressed into the plaster negative and cured with heat.

The implants were five in number. The smallest was 11.5 mm. at its widest point, 16 mm. high and 34 mm. long. The largest was 15 mm. wide, 18 mm. high and 39 mm. long. Each was tapered sharply at its periphery so the perichondrium would fit snugly about it, leaving no space. Finally, it was burnished smooth and was sterilized by placing it in bichloride of mercury for at least one hour. Implants showing cracking, chipping or checking were discarded.

#### TECHNIQUE.

All crusts were carefully removed by suction and bayonet forceps. Subperichondrial infiltration with 1 per cent novocaine was carried out and a submucous resection was done in the usual manner. All cartilage chips were carefully removed from between the mucosal flaps and an acrylic implant was chosen which would sufficiently narrow the nasal space but still permit comfortable nasal respiration. The

implant was inserted between the mucosal flaps and the incision was held together with a small bayonet forceps. The patient was instructed to breathe in and out of the nose in the normal manner. He then stated whether or not the airway was adequate.

After the implant of proper size was in place, the incision was closed with two or three interrupted silk sutures. Before the last suture was in place, 1 cc. of normal saline containing 5,000 units of penicillin was placed between the flaps with a syringe. No packing was used. Thirty thousands units of penicillin were given intramuscularly every three hours for 24 hours. The sutures were removed on the sixth or seventh postoperative day. Gentle point suction of the nasal floor every few days proved to be the only postoperative care necessary other than occasional self-administration of nose drops containing a mild vasoconstrictor.

#### RESULTS.

All patients in whom there was a loss of the sense of smell prior to operation were tested with the essential oils for its return three weeks after operation.

In six of the seven patients, crusting was diminished. In two of the three patients who had lost their sense of smell, this returned following the operation. In all cases with ozena, this distressing symptom was eliminated except in Case 7, where faulty technique caused failure.

#### DISCUSSION.

It is interesting to note that in only one case (No. 7) did the atrophy involve the perichondrium of the septum. In the other six it was confined to the lateral nasal wall and floor. Singular also was the behavior of the incision: in three cases it spread spontaneously on the day following suture removal and closed again without surgical intervention. One incision remained open for six weeks and gradually closed spontaneously. When one realizes how difficult it is to keep incisions

Case	Age	Sex	Duration	Types	Symptoms	Time—Postop.	Results
1	41	F	31 years	Primary	Crusting, odor, loss of sense of smell	10 months	Cessation of crusting, cessation of odor, return of sense of smell
2	47	F	25 years	Primary	Crusting, foul odor	9½ months	Cessation of crusting and odor
3	20	M	10 years	Primary	Crusting, odor, loss of sense of smell	7½ months	Partial cessation of crusting, loss of odor, return of sense of smell
4	22	M	18 years	Primary	Nasal obstruction, crusting, odor	7 months	Cessation of crusting
5	27	F	25 years	Probably primary, noted following measles, age two	Crusting	3 months	Cessation of crusting
6	33	M	Since childhood	Primary	Crusting, odor, loss of sense of smell	2 months	Cessation of crusting and odor. No return of sense of smell
7	35	M	Since childhood	Primary	Crusting, odor	3 weeks	Extrusion

closed over inclusions elsewhere, it is truly amazing that closure should occur in such a surgically dirty area.

The postoperative course was always attended by considerable edema and excessive mucus formation which did not resolve completely for three weeks. For this reason, the test for the return of the sense of smell was deferred for this interval.

Extrusion of the implant occurred in one case (No. 7), and this mishap was due to faulty operative technique. The mucous membrane opposite the side on which the incision was made was perforated with the elevator and though this perforation was sutured, it reopened when the sutures were removed. The inclusion extruded through this perforation.

Removal of the cartilage may offer a solution to the old problem of prevention of extrusion of the implant. It is logical to assume that an implant is more apt to stay in place permanently when it lies between vital flaps of mucous membrane than when it rests in juxtaposition to cartilage which has been deprived of its supply of nutrition.

Several precautions must be taken in the operation. The fact that inclusions are more successful in a nonkinetic area is legion. For this reason, the septum must not be moved postoperatively.

While elevating the mucoperichondrium, care must be exercised to avoid buttonholing. A buttonhole so small as to be of no significance in a routine submucous resection might enlarge alarmingly when the plastic inclusion is in place. Should this error occur inadvertently, the flaps should be placed against the cartilage and packed for 24 hours. The operation may then be attempted after six weeks have passed.

Selection of the proper sized implant is important. In one case (No. 3) it was too small and results were only partially successful.

The number of cases in this preliminary report is admittedly small and the oldest implant has been in place only 10 months, but the results are encouraging in view of the early extrusion

of inclusions reported by others. All of the patients are much improved.

#### SUMMARY.

1. The use of methyl methacrylate implants in a septum-widening procedure for atrophic rhinitis is discussed.
2. Reasons for removal of the septal cartilage prior to insertion of the implant are presented.
3. Results of seven cases so treated are reported.

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Appreciation is expressed to Dr. S. E. Jaynes, of the Department of Pediatrics, Washington University School of Dentistry, for his aid in the preparation of the acrylic implants.

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#### NEW YORK ACADEMY OF MEDICINE CENTENNIAL.

The New York Academy of Medicine inaugurated its Centennial Celebration with a dinner, March 6, at the Waldorf-Astoria Hotel in New York.

THE LARYNGOSCOPE congratulates the Academy on this Centennial event and on its splendid achievements throughout this century of progress in medicine. This is an enviable record, worthy of emulation and a challenge to the future.



## CRITICAL SURVEY OF THE LEMPert ENDAURAL FENESTRATION OPERATION.\*

MARVIN F. JONES, M.D.,  
New York, N. Y.

In the year 1944,<sup>1</sup> I was delegated by the Committee on the Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology to make a report on the Lempert fenestration<sup>2</sup> operation. Few statements regarding fundamentals made at that time need to be altered. No changes since the nov-ovalis fenestration procedure described by Lempert<sup>3</sup> have materially altered the surgical results he reported; neither does any modification of his nov-ovalis fenestration procedure possess any logical reason for expecting any increase over his percentage of successes.

The word "percentage" is becoming increasingly irritating to me because of its abuse. Our efforts are now directed toward obtaining information which will complete our understanding of the entire subject of impaired hearing and the percentage of surgical results assumes secondary importance. Any of us can select patients who are ideal cases for surgery, and if we limit our selections to this most favorable group, our percentage of successes will be high. If, however, some of us desire to select the less favorable cases, in order to increase our understanding, naturally our percentage of successes will be lower.

In the Conservation of Hearing Clinic at Manhattan Eye, Ear and Throat Hospital the custom is to classify patients with impaired hearing as four types.

1. Ideal cases (comparatively rare).
2. A good risk (satisfactory and common).

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\*Read at the meeting of the New York Academy of Medicine, Section on Otolaryngology, Feb. 19, 1947.

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, March 9, 1947.

3. A poor risk (the few who have a chance to recover some hearing).
4. Unsatisfactory—occasionally operated—after thorough explanation to the patient, followed by a period of at least three months for consideration.

The typical case of otosclerosis should have impaired hearing which is usually binaural. The patient's ability to hear high tones remains good while the hearing for low tones is diminished. The hearing by bone conduction appears increased when compared with the patient's ability to hear by air or when compared to the bone conduction of a normal hearing person. The names Rinne and Weber have been attached to phenomena which show changes in proportionate air and bone conduction or changes in the degree of ability to hear by bone conduction. If these phenomena are understood, proper names seem unnecessary. The term Paracusis Willisiana designates the ability of a patient to hear better in a noise than a person with normal hearing.

A family history of deafness is considered by some authorities as being essential before a diagnosis of clinical otosclerosis can be made. Tinnitus is a common complaint but is of no diagnostic value. The salmon pink membrana tympani, which has been so methodically described in the textbooks does occur, but not frequently.

So much for the usual findings in clinical otosclerosis. Typical cases are rather rarely found in the average practice.

Nerve deafness patients show a high tone loss while the low tones are maintained. Bone conduction is diminished or absent and loss in hearing may be monaural or binaural. Both types are nonsuppurative.

Many cases of nonsuppurative deafness have a combination of both types. This group will probably contain the majority of all persons with impaired hearing. The personal judgment of a surgeon, based on experience, enables him to select from these groups patients who are the most satisfactory candidates for surgery. *Proper selection* of patients is one of two essentials necessary to obtain the best results. A

thorough knowledge of all methods used in testing auditory acuity is required if any doctor is to make reasonable selections.

The other essential in obtaining good results is a properly trained surgeon with superior ability.

I referred to this second essential in my report to the American Academy of Ophthalmology and Otolaryngology. As time has passed, this reference has assumed major importance. There are those surgeons who just do not have the surgical skill to master the fenestration technique. There are also those surgeons who think that six weeks' instruction in cadaver surgery will qualify them to do fenestration surgery. Practical personal experience plus a limited experience in teaching men who completed cadaver surgery has shown me the need for further clinical training under supervision. The greatest danger to a useful future in fenestration surgery is end-result of surgery done by incompetent and poorly trained surgeons.

The patient's viewpoint deserves a few comments. Our patient has an impairment in hearing. His desire is to be able to hear and communicate with his fellow-man. If he cannot hear adequately, he has three choices, *i.e.*, surgery, hearing aids, or retraining in other methods of communication. This situation, in short, is the problem which the patient asks the doctor to solve, and much can be done.

At the present moment the public, and possibly the medical profession, is confused. Statements have been made by some of the medical profession and some of the hearing device company representatives which, unfortunately, have increased confusion. Consequently an unbiased review is worthwhile.

People who have impaired hearing require a doctor's time in adequate amounts for a thorough explanation of their condition. Time thus spent prevents much misunderstanding. A deafened patient's first question is usually, "Which would you advise for me, an operation or a hearing aid?" My answer will not be popular in many circles. I have seen many comparatively young people wearing hearing aids who should

have had surgery; however, because their otologist scared them with misinformation or distorted information regarding operation, they were denied the opportunities which surgery offers. Impartial and intelligent advice in the choice of an operation or hearing aid is the great need of the patient with impaired hearing today. If an operation is not advised and the hearing aid proves inadequate, our patient should be thoroughly informed about other means of communication. They should not only be informed, but they should be guided in various training methods through which their lives can become of greater economic value and their social enjoyment increased.

There is a place for the fenestration operation, the hearing aids and training programs in the proper care of the patient with impaired hearing. The otologist should be the one best qualified to help the patients in their selection.

The person with impaired hearing lives in an unnatural atmosphere. It is a real feat for him to maintain emotional stability. Anything which disturbs his emotional equilibrium unnecessarily should be avoided. When he has been promised a 95 per cent chance of regaining normal hearing, he is greatly disturbed to find that his supposed excellent chance has failed. It is also disturbing when he has been informed by competent otologists that he has a good chance of regaining serviceable hearing through an operation, to have instrument salesman frighten him regarding the indicated surgery in order to sell an instrument.

Since the dangers of this fenestration operation have been stressed to the patient, let us consider the dangers! *Providing* a thorough physical examination together with laboratory test proves that the patient is a good surgical risk, the danger incurred during a fenestration operation performed by a competent specialist in fenestration surgery is no greater than the danger incurred by the patient during any elective major surgical procedure.

Dizziness, discharge, facial paralysis and further impairment of hearing are often mentioned. These seem to be the

leading familiar ghosts used to frighten patients. Transient dizziness, nausea and instability are not uncommon postoperative complaints. Persistent dizziness is a rare occurrence.

A discharging ear has proven to be the most annoying postoperative feature with which I have had to deal. Changes in my recent technique have reduced the incidence.

Facial paralysis has always been the *bete noir* of the otologist. One thing I can promise: if an otologist can be trained to do an acceptable fenestration operation, the incidence of facial paralysis following all his other otological surgery will decrease. He will become thoroughly acquainted with the course of the facial nerve. Dr. Thomas G. Tickle conducts our facial paralysis clinic at the Manhattan Eye, Ear and Throat Hospital, and he informs me he has not seen these cases following fenestration. It is surprising to me that more facial paralyses have not occurred. Transient facial paralysis may occur, but permanent facial paralysis is rare. I believe facial paralysis has been overemphasized as a danger.

Some patients are told, "You may lose what hearing you have"; and this is true. The sound of this statement is more alarming than the facts of the case would warrant. It is a practice among fenestration surgeons to perform operations on patients whose hearing is below the useful level; therefore, the ear chosen for operation is usually in a practically useless range. The hearing in the good ear remains unchanged, therefore the patient's ability to hear following the operation should remain the same even on those rare occasions when the hearing in the operated ear is entirely lost.

The enthusiasm of a patient immediately following operation is apt to be dampened when he becomes accustomed to his improvement. A patient says, "My hearing is worse than before operation," when in reality all the known tests show a maintained improvement.

It should be borne in mind that the fenestration operation *sometimes* results in normal hearing, but the usual improvement falls in the zone between 15 and 25 db. loss. This is a useful hearing level, but it is not normal; also, the unoper-

ated ear may continue to deteriorate and cause some decrease in hearing acuity.

Progressive deafness is an accepted term when applied to clinical otosclerosis. This term means what it implies. The deafness is usually progressive, and those unfortunates who have impairment in youth can rely on being incapacitated in middle life. In this type of progressive deafness the nerve may suffer increasing damage, thus reducing the chances of a good surgical result in proportion to the degree of such nerve damage. Time lost during the period when surgery is most effective cannot be regained.

The fenestration is not a 100 per cent effective operation. We do have failures.

The greatest cause of failure is a bony regrowth which closes the artificial window. No method has been devised which insures against closure. Two promising procedures are now in the experimental stage. Surgical revisions prove that a disturbing number of fenestrations do close regardless of any methods used in prevention.

I would choose as a close second in the cause of failures, wrong diagnosis. Our present methods of diagnosis are inadequate. They are based on unconfirmed research performed many years ago. These diagnostic methods have been traditionally accepted. The error in diagnosis, therefore, is not the fault of the examiner, but the fault of the method. How else can one explain the discrepancy in the diagnosis of otosclerosis clinically and its incidence at necropsy? How else can one explain the complete failure to obtain satisfactory results following operation on patients with typical clinical otosclerosis when perfect technique has been used? Also unexplainable is the occasional satisfactory result following surgery performed on a patient with a diagnosed "nerve deafness." Under the heading of errors in diagnosis is a good place to interject a thought.

Our methods of diagnosis have been based on traditionally accepted statements. The day has arrived to question some

of these statements. They should be substantiated by meticulous repetition of the experiments or disproved as a result of our different observations. This paper is entitled, "A Critical Survey of the Fenestration Procedure." To me, perhaps the greatest contribution to otology which the fenestration operation can make is the opportunity to know more about the physiology, physics and chemistry of the structures concerned in hearing. It is the first time the structures of the inner ear have been observed under the microscope in their normal state. It is the first time that the fluid of the perilymph has been explored and its containing and contained membranes manipulated. It is the first time the terminal nerve mechanisms have been observed *in vivo*. The fenestration operation offers the greatest opportunity of any agent known to date by which deafness of the future may be prevented. Proper and accurate understanding of the organ of hearing has been needed for many years.

Surgical accidents must be included as causes of failure. Motor driven instruments, vagaries of electrical equipment, mechanical defects in instruments, and just plain slips have been the cause of failures. I might also add they will probably continue to cause failures. When a rotating burr tangles with a delicate and carefully made membranous flap, the damage is done. When the adjustment on electrical devices is accidentally altered or a "short" occurs, damage may be done. When a defective instrument breaks, the gods of chance control the outcome. When some enthusiastic observer bumps the surgeon's arm while he is using a suction near the fenestration, the only thing left to do is swear.

This most difficult and delicate of all surgical techniques penalizes any liberties or lapses from constant vigilance.

Infection causes some failures. Even when the complete surgical aseptic technique of brain surgery is employed and the most painstaking technique is observed during postoperative dressings, infections do occur.

There are other miscellaneous but more isolated causes of



failure which are well known to those of us who have studied and performed fenestration surgery.

Statistics can be made to prove anything, and percentages are sometimes used for an impressive argument.

In the early enthusiasm of this work a rush was made to see who could report the largest percentage of "cures." It seemed to be concerned with some magnetic attraction for patients. My own precept is, do your job to the best of your ability and forget percentages. Thousands of operations must be done before percentages will have any significance.

Standards for reporting have been proposed. The standard accepted by most of us today is the 30 db. loss level. This means that the pure tones in the conversational range (512, 1,024 and 2,048) must all have better than a 30 db. loss in order to be classed as satisfactory. The length of time which must elapse before we can consider a result permanent varies. A year is reasonable and two years is safe. If patients have maintained improvement (without loss) for two years they may be classed as permanently improved patients. This may not be entirely fair for those reports which include patients with a profound loss before operation and following operation, a 10 or 15 db. rise makes them satisfied. Such patients may be reported as exceptions.

The psychological factor needs further study. We know that intense concentration or fatigue will favorably or adversely affect an audiometer reading as much as 10 or 15 db.

Personal experience in the causes of failure plus the recognition of justice in some uniform standard of reporting compels me to state that any surgeon reporting according to the accepted standards, who attains a 60 per cent permanent improvement by his surgery, may assure himself that he is getting excellent results.

There are those of us who have made a study of impaired hearing through our entire medical careers. We have labored hard and diligently with little remuneration in added knowledge by which we could help our handicapped patients. It



is understandable that some of us have perhaps become too enthusiastic when productive opportunities are suddenly offered. It is also understandable that some of us who have been saturated with traditional otology should be skeptical. Perhaps this is for the best; however, we must all keep one thing in mind: there will always be the "new" in all things. Medical scientists, beyond all others, must be at the same time conservative, liberal and judicial. A great advance in otology has been made. Injudicious words and actions may retard the progress of a greater advance, but they cannot stop that advance.

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121 East 60th Street.

## CONTACT ULCER OF THE LARYNX. A CASE REPORT.

HARRY C. ROSENBERGER, M.D.,  
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My purpose in presenting this report of contact ulcer is twofold: first, to call attention afresh to this interesting condition which may so confound the laryngologist; the other reason pertains to the patient whose laryngeal function may be seriously impaired if not ruined by unskilled and ill-considered treatment.

The incidence is undoubtedly much greater than that indicated by the reports in the literature of 244 cases up to 1937 as stated by Jackson. It is interesting that this clinical condition was first described by Jackson so relatively recent as 1928.

The clinical picture is that of an ulcer on the posterior end of one or both vocal cords. The ulcerated area may be more or less covered with a granulomatous protuberance. The ulcerated tip of the involved arytenoid cartilage may be visible. Cord movement is normal unless the joint be involved by chondritis. The patients' complaints include various combinations of hoarseness, tired voice, localized or referred discomfort and cough.

Contact ulcer is a disease of adult males. If vocal abuse alone were an important etiological factor, it is curious that the gentler sex has been so spared. Causative factors such as poor mouth hygiene, sinusitis, irritating atmospheres, infected tonsils and acute respiratory infections have been suggested. A plausible causative mechanism is that of the traumatic "hammer on anvil" effect as the arytenoids meet during phonation, and especially phonation that is harmful to the larynx. This possibility is emphasized by Jackson.

When a contact ulcer is seen, the laryngologist must make a differential diagnosis. Such conditions as tuberculous or

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luetic ulcer and malignancy must be considered and eliminated. Benign tumors offer more difficulty when a granuloma is present, and here a biopsy is helpful.

The pathological picture is that of a nonspecific granuloma. The amazing thing is that, although the perichondrium is involved, the underlying cartilage is seldom affected. This explains why the involved arytenoid remains more or less normal in appearance except for the presence of the ulcer.

As emphasized by Jackson, Clerf and others, the utmost care must be exercised to avoid injury to the subjacent cartilage, whether by an instrument or a chemical. Permanent impairment of the voice due to cartilage fixation or destruction may result from clumsy instrumentation or unwise cauterization. Probably the single most important factor in treatment is voice rest over a period of weeks or months, as the condition may warrant.

I have chosen the following case report from among several chiefly because of the large number of excisions of the granuloma during the period of treatment.

#### CASE REPORT.

Mr. L. P. D., aged 45, has been a patient of mine since 1941. Routine examination of the larynx in 1941 was negative except for slight diffuse congestion possibly related to excessive cigarette smoking. The examination of the larynx was merely incidental to a complaint of hearing loss. There was no complaint at this time of any throat trouble.

On Oct. 4, 1943, this patient consulted me because of a full, tired feeling in the throat which he had noted for several weeks and which apparently was the sequel of a mild pharyngitis. Examination of the larynx revealed a grayish red soft tumor, 1 cm. in diameter, attached to the medial and upper surface of the posterior end of the left vocal cord and adjacent arytenoid. The voice was only slightly hoarse. The larynx otherwise was quite normal except for slight reddening of the medial aspect of the opposite arytenoid. The movement of both cords was equal and normal.

On the following day the tumor was removed under local anesthesia by the indirect method. Cupped laryngeal forceps were used. The tumor was rather firmly attached. The pathological diagnosis was granuloma pyogenicum. The patient was advised as to the necessity for voice rest, but his position as an executive in a busy war plant precluded the full accomplishment of this objective.

In three months the granuloma recurred to three-fourths of its original size and was again removed with an identical technique. This time,

however, the base was gently touched with a silver nitrate bead. The pathological report again was granulation tissue.

From Oct. 5, 1943, the time of the first removal, to April 28, 1945, the date of last removal, an interval of 18 months, this recurring granuloma was removed a total of 13 times. The pathological examination was always granulation tissue without evidence of malignant change.

During this time a trial of Roentgen therapy locally was also made without apparent clinical result, favorable or unfavorable. Since the last removal there has been no evidence of recurrence to date. The site of the granuloma and ulcer is now normal appearing mucous membrane and the host arytenoid is quite normal in size, position and function.

In retrospect I do not recall ever having seen a contact ulcer in the larynx of a singer, speaker, huckster or peddler, although all of these occupations require unusual and oftentimes violent arytenoid activity; however, among such patients chronic laryngitis and pachyderma of the interarytenoid space is not uncommon.

It would appear likely that some underlying cause must exist to render the local region susceptible to traumatic ulceration. Perhaps such a factor, as Jackson suggests, may be the cascading mucus and salivary secretions from the sinuses, nose and mouth which more or less constantly flow over the arytenoids.

In conclusion, it is reasonable to urge conservatism, gentleness and patient persistence in dealing with contact ulcers of the larynx.

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**DR. PROSPER MENIERE—  
A HISTORICAL SKETCH.\***

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Washington, D. C.**

It was about 85 years ago that medical men began to talk about a new disease which they called Ménière's disease. It soon became an accepted eponym in the medical literature of all countries, and its use has been continued with unabated frequency to the present time, notwithstanding constantly recurring objections and notwithstanding much new information in the physiology and pathology of the subject concerned.

Although Ménière's disease is well known, Ménière is not; in fact, there actually exists some confusion as to his identity. We find sometimes Paul, sometimes Prosper, sometimes Emile given as the first name of the discoverer of the disease.

In the article on Ménière's disease in the Encyclopedia Britannica, you are informed that the disease gets its name from a French otologist, Emile Antoine Ménière; Prosper is not mentioned. Turning to the authoritative French encyclopedic dictionary Larousse, you will find a biographical sketch of Prosper Ménière but no mention of his discovery of a new disease.

This sketch is followed by one of his son, Emile Antoine Ménière, and the same mistake is made of crediting him with the discovery of the so-called Ménière's disease.

This confusion is no doubt explained by the fact that the father, Prosper Ménière, was a general practitioner, and if anything an obstetrician, and he described the disease in question near the close of his career—in fact, in the last year of his life.

The son was an ear specialist and had written a memorable

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## MENIERE. — FORME DE SURDITE GRAVE.

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— M. DEVERGIE demande la parole pour une motion d'ordre. Il propose, vu l'importance du sujet traité par M. de Kergaradec, d'ajourner la discussion de son travail jusqu'à l'époque où le rapport sur le mémoire de H. Hatin, relatif au même sujet, aura été communiqué à l'Académie.

Cette proposition, appuyée par MM. Londe, Tardieu, Adelon, et consentie par M. de Kergaradec lui-même, est combattue par MM. Bouillaud et Depaul, qui proposent d'ouvrir la discussion dès que le travail de M. de Kergaradec aura été imprimé. Cette dernière proposition paraissant avoir l'appui du plus grand nombre des membres, est mise aux voix et adoptée.

H. *Sur une forme de surdité grave, dépendant d'une lésion de l'oreille interne*, par M. MENIERE. (Commissaires: MM. Cruveilhier, Baillarger et Barth.)

(Extrait par l'auteur.)

L'auteur résume ce travail en un certain nombre de propositions :

1° Un appareil auditif, jusque-là parfaitement sain, peut devenir tout à coup le siège de troubles fonctionnels, consistant en bruits de nature variable, continus ou intermittents, et ces bruits s'accompagnent bientôt d'une diminution plus ou moins grande de l'audition.

2° Ces troubles fonctionnels ayant leur siège dans l'appareil auditif interne, peuvent donner lieu à des accidents réputés cérébraux, tels que vertiges, étourdissements, marche incertaine, tournoisements et chute, et de plus ils sont accompagnés de nausées, de vomissements et d'un état syncopal.

3° Ces accidents, qui ont la forme intermittente, ne tardent pas à être suivis de surdité de plus en plus grave, et souvent l'ouïe est subitement et complètement abolie.

4° Tout porte à croire que la lésion matérielle qui est cause de ces troubles fonctionnels réside dans les canaux demi-circulaires.

The first published reference to Ménière's disease (Bull. de l'Acad. de Med., Paris, 1860-1861, XXVI, 241) being an abstract made by the author himself of a paper read before the Academy, Jan. 3, 1861.

paper on the subject of Ménière's disease, which he read before the Twelfth International Congress of Otology at

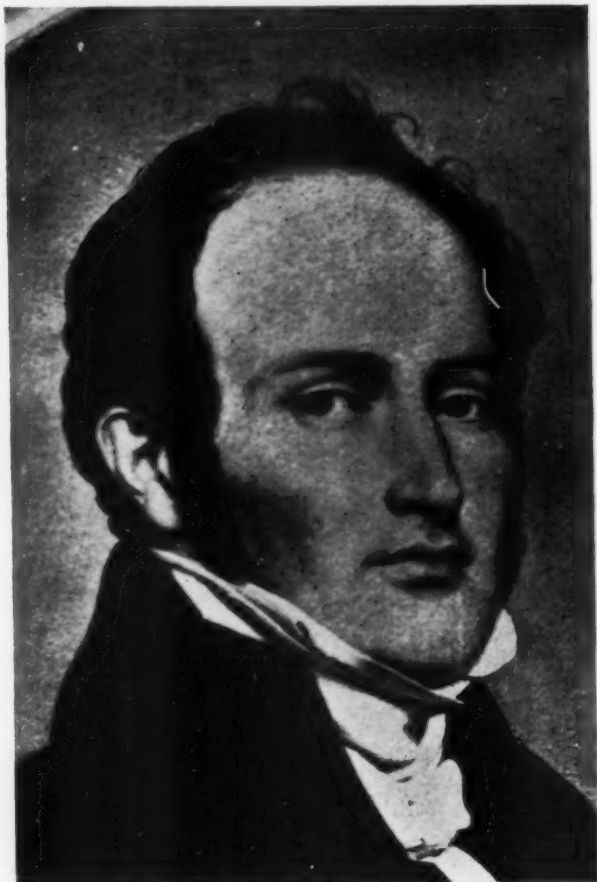


MARIE CAROLINE DE NAPLES, DUCHESSE DE BERRY.

HENRI, DUC DE BORDEAUX, HENRI V.

Milan, in 1880, but the father, Prosper, had already given a perfect description of the disease, 19 years earlier.

His original paper, entitled "*Sur une forme de surdité grave dependant d'une lesion de l'oreille interne,*" was read before the Paris Academy of Medicine, Jan. 3, 1861, and was pub-



lished in the bulletin of the Academy of that year (*Bull. Acad. Imp. de Med.*, 1860-1861, XXVI, 241). Dr. Prosper Ménière followed up the subject by a series of contributions



which were published in the *Gazette Medicale* of the same year.

It was in one of these, under date of Sept. 21 (p. 596), that occurs the report of that original case in which the Doctor had performed an autopsy and discovered evidence of trouble in the semicircular canals.

By 1880, when the son's paper was presented to the International Congress, Ménière's disease had already received much attention in medical literature and was well known under that name.

Dr. Adam Politzer in a paper published in the year 1867 (*Archives fur Ohrenheilkunde*, Vol. II, p. 88), was, we believe, the first otologist to recognize the significance of Ménière's observation and to comment upon it.

Many other contributions shortly followed, including some from this country.

Dr. H. Knapp, of New York, had a paper on the subject in the *Archives of Otology* of 1870-1871, and in it he refers to the 1861 contribution, which he stated he had read in the original, but which, nevertheless, in his bibliography is credited to a Paul instead of Prosper Ménière. This mistake was copied by some succeeding writers.

Emile Ménière never intended to take to himself the credit of being the discoverer of the disease. In the article mentioned, which appeared under the title, "Some Observations on Ménière's Disease," he does not fail to refer to his father's contribution and to express his pride in the fame his father had achieved on this score.

The famous original case reported by Dr. Prosper Ménière—the one in which death suddenly occurred and an autopsy was performed—was that of a young girl who during her menstrual period had journeyed all one winter night on the top of a public carriage, and as a result had become thoroughly chilled. She was brought into the clinic, where it was observed she suffered from vertigo along with deafness; and

also with attacks of vomiting upon the slightest provocation. Death occurred upon the fifth day, and on autopsy the brain, cerebellum and spinal cord were found free of any evidence of disease.

Prompted by the observation of the complete deafness present, Dr. Ménière undertook to section the temporal bone and examine the labyrinth, whereupon he found the semicircular canals to be filled with a "reddish plastic exudate."

Now, this case has been frequently quoted and commented upon, and nearly always with the repetition of two erroneous statements—one that the patient became ill as the result of a "cold," and the other that Dr. Ménière had reported the findings as a hemorrhage into the labyrinth. As was first pointed out by Dr. Dan McKenzie, of London, and later by Dr. Miles Atkinson, of New York, Dr. Ménière never stated that the patient had a cold, and never said anything about there being a labyrinthine hemorrhage.

The perpetuation of the latter mistake especially had much to do with the tendency to discredit Ménière and question the propriety of employing the term "Ménière's disease"—owing to the fact that subsequent investigations failed to find what Ménière is supposed to have found.

It would be difficult even today to improve upon the author's original description of what has come to be known as "Ménière's disease."

"An auditory apparatus perfectly sound can suddenly become the seat of functional disturbance consisting of noises of various character, continuous or intermittent, and these are soon accompanied by more or less great diminution of hearing. These functional disturbances having their seat in the internal ear often can cause attacks considered cerebral, such as vertigo, staggering, uncertain gait, rotation and falling, and accompanied besides by nausea, vomiting and a syncope state. The attacks which are of intermittent form are soon followed by deafness, more and more grave, and often the hearing is even suddenly and completely obliterated. All this leads us to believe that the material lesion which is the

cause of these functional disturbances resides in the semi-circular canals."

Objection has been made, as stated, to classifying the malady described by Ménière as a true disease—a syndrome or symptom-complex, if you like, but not a disease.

One cannot be too dogmatic on this score because medical nomenclature is not a fixed science and changes with advances of medical knowledge.

Early in the nineteenth century, under the influence of the pathologists, the medical profession became imbued with the view that there was only one criterion for the diagnosis of a disease—and that was the presence of definite morbid changes in the tissues associated with a certain clinical picture; but later in the century, under the influence of Pasteur and Koch, the pathogenic micro-organism came to be regarded as the all-important factor and as a consequence, the associated morbid change as an effect rather than a cause.

Classification of disease has, we believe, been rendered more difficult by reason of a natural tendency to regard individual diseases as distinct entities which, like plants or animals, could be classified by genus and species.

Disease is a condition—an abnormal state; and a particular disease is a particular disorder of the body characterized by a special group of symptoms which tend to recur in the same association. It is according to this understanding that we accept migraine, epilepsy and hysteria, for example, as definitely entitled to be considered and to be called diseases—though we can assign to them no definite cause and no definite pathology.

If we admit such afflictions as these into the rank of true disease, on what ground can we deny the same privilege to the malady described by Ménière?

As a matter of fact, recent studies show that Ménière's disease is characterized by a special pathology, for Hallpike and others have identified this as a hydrops of the labyrinth; therefore, for those who consider that a definite pathology

is the *sine qua non* for using the term disease, this also seems to be satisfactorily supplied.

That Dr. Ménière should be so little known in medical circles is all the more remarkable for the fact that he was an eminent man in his day. He made some notable contributions to general literature, especially on subjects of interest to medical men, and he was highly esteemed in literary and political circles.

If he had any idea of his name going down to posterity, he no doubt thought it more likely for other reasons than his work strictly in medicine. He might well have thought that it would be due to his literary work, or at least because of his literary associations. The fact is, he came near being immortalized by being made a character under his own first name in one of Balzac's novels; but this was later changed because of a falling out with the great novelist. He might perhaps have thought it possible that he would secure enduring fame in French literature, much in the same way as Pepys did in English literature, by his diary or journal recording anecdotes and intimate conversations of many of the celebrities of his day; or most likely of all that his best chance for fame was by reason of his connection with a certain important event in the history of his country—of which we will have something to say later on.

Prosper Ménière, the son of a small merchant, was born at Anger, June 18, 1799.

He obtained his high school and his preliminary medical education in his native city; but at the age of 20 left to continue his medical studies in Paris, where he became an externe at the Hotel Dieu. After three years, he obtained an appointment as interne in this famous medical institution and he was fortunate in becoming an assistant at one time or another of three men who stood at the very top of their respective specialties: Paul Dubois, the obstetrician; A-F Chomel, the internist, who did much to reform the then prevailing practice of excessive bleeding; and Guillaume Dupuytren, the leading surgeon of France.

Dupuytren devised many new operations, and his clinics were crowded with students from all parts of the world.

Ménière must have been a very competent and a very versatile young man, because he became in turn chief of clinic for each of these noted men, and sometimes carried on their clinics during their absence.

He received his doctorate in 1828. In the year 1830, he had a unique surgical experience. He was serving as chief of Dr. Dupuytren's clinic when the hospital wards became jammed by the wounded during those bloody days of the July Revolution. Over 400 were admitted on the first day. Ménière wrote an animated description of the scene, with a full record of the nature of the wounds and the method of treatment.

It is said that this report was freely used by Dupuytren in his well known treatise on war injuries.

Ménière was made Fellow of the University in 1834, and began a course of lectures, first on hygiene and then on obstetrics.

In 1835, he was selected by the government to head a commission to combat an outbreak of cholera in Southern France, and for services in this connection he was made a Chevalier of the Legion of Honor. Along with other subjects, Dr. Ménière had given some attention to otology. Besides a paper or two on the subject, he translated a treatise on otology from German into French.

When, in 1838, the position of chief physician to the Institute of Deaf-Mutes became vacant, he was given the appointment, which he held until the time of his death.

The variety of Dr. Ménière's interest in matters medical may be judged from the following list of contributions:

- 1826—A note on the diagnosis of peritonitis.
- 1826—A memoir on interstitial pregnancy.
- 1828—On congenital deformity of the hands and feet.
- 1828—On cerebral hemorrhage during pregnancy.
- 1828—Phlegmatic tumors occupying the right iliac fossa.

- 1828—Clinical studies on the etiology and pathology of uterine disease.
- 1832—A treatise on the signs furnished by the pulse for the diagnosis of disease.
- 1837—A treatise on clothes and cosmetics.
- 1841—An examination of the auditory apparatus.
- 1853—On the treatment of deafmutes and their instruction.
- 1856—On marriage between relatives as a cause of deafness.
- 1861—Papers on labyrinthine vertigo.

In the year 1833, Dr. Ménière's regular career was interrupted by a call from his government to undertake a post of high importance and of special direct interest to the crown.

Let us recall briefly in this connection a few historical facts. After the fall of Napoleon, the throne of France was restored to the Bourbons. Two brothers of the ill-fated Louis XVI were kings in succession.

First came Louis XVIII, who ruled in a moderate way with constitutional safeguards.

When he died in 1824, having no son, a second brother, Charles X, succeeded him. Charles had different ideas as to the prerogatives of a king. He is quoted as saying that he would rather chop wood than rule as a limited monarch.

Accordingly, when he thought the time ripe, he issued ordinances restricting suffrage, curtailing the press, giving large pensions to the exiled nobles and restoring the influence of the Jesuits.

What followed was the bloody Revolution of July, 1830, when the citizens of Paris tore up the pavements to erect barricades against the soldiers and police.

Charles was compelled to abdicate, and both he and his son to renounce any future claim upon the throne.

Louis Phillipe, who was of Bourbon descent by an indirect line, but who professed republican sentiments, was discov-

ered by the mob—and when Lafayette put his arm around him and the tri-color was raised above his head, the people decided he was the man they wanted, so they made him regent, and a little later he made himself king.

Now, Charles had a son, the Duc de Berry, who was assassinated in 1820, leaving a widow and a little daughter. About seven months later, however, his widow, the Duchess de Berry, gave birth to a son—who came to be known as the “miracle child”—and on him the legitimates pinned their hope for the eventual restoration of the true Bourbon line.

Charles X, on abandoning the throne, requested his distant cousin to name this grandson to become his heir and to be designated as Henry V of France; however, the new king forgot all about this, as he had troubles of his own, and also, no doubt, plans of his own.

Now, the Duchess de Berry, originally Caroline Louise, the daughter of the King of Naples, was quite a remarkable person. She was not only beautiful, but clever, witty, well-informed and a good conversationalist. She was also very ambitious and she made up her mind that, somehow, her son must become the King of France.

Returning from exile in 1832, she landed at Marseilles and attempted to rally support for her cause, but her followers were defeated and she was entrapped and imprisoned at the castle of Blaye. The duchess had been there but a short time when it was rumored that she was about to have another child; so the government decided to appoint a physician to determine the truth of the matter and to superintend her health. The person to be appointed for such a delicate mission must have not only professional ability but address and tact.

When application was made to Dr. Orfila, dean of the university, he recommended Dr. Prosper Ménière as the best fitted person he knew, although he was then a comparatively young man—age 33.

He hesitated for a while and then accepted with the proviso that his duties were to be strictly professional.

He proved to be an excellent choice for the post. The princess was recalcitrant and antagonistic toward her military guardians, but Dr. Ménière won her confidence and they became good friends. She used to delight to converse with him on subjects of literature, art and science — especially on geology, in which science she was particularly well-informed, and on botany, of which Dr. Ménière had made a special study. The Doctor kept a day to day record of his nearly six months' tour of duty, which was published after his death by his son.

Space will permit our quoting but one entry—and that only in part.

"Sunday—March 31.

"This is the day that marks an epoch in my life. This morning, while at my bath, I was reflecting on the incidents of last evening, when I heard voices cry out, 'They are calling for M. Ménière!' I rang my bell, when soon there entered my room a gentleman dressed entirely in black, who saluted me verp politely and, coming near so as to speak in my ear said: 'Is this Dr. Ménière to whom I have the honor to speak?' 'Yes, Monsieur.' 'The Dr. Ménière who recently came to Blaye?' 'Yes, Monsieur.' 'I am charged, Sir, to invite you to the palace of the Tuilleries this very day at ten o'clock. His Majesty desiring to speak with you, you will please present yourself at the King's Chamber'."

Dr. Ménière went to the palace accompanied by the king's physician, Dr. Auvity.

"The king, in a black dress coat, was seated near a table at the end of the room. I saw him get up and come toward us at once. He said, 'Good day, Doctor' (to M. Auvity), and then to me. 'Good day, Dr. Ménière. I am happy to see you. I have heard much about you. Be seated, gentlemen.'

"In saying that, the king took a seat on a large sofa near the window, which looked over the garden of the Tuilleries. He made a sign with his hands for me to be seated near him,



and as I hesitated out of respect, His Majesty said again: 'Be seated, I pray you, we will converse more easily.'

"M. Auvity took a chair and we are thus placed together in a sort of triangle; the king began:

"I thank you, Monsieur le Docteur, for the manner in which you have performed your mission with the Duchess de Berry.

"You see the princess every day, often even several times a day, and during these long interviews you have frequent occasion to hear her complain of me.'

"I could not restrain a gesture that seemed like a protest to his words, and the king continued:

"Oh, that is simple enough. She attributes to the government, and especially to me, her detention at Blaye and all its disagreeable results.

"It is just on account of this that I wish to see and speak with you. I have in mind to furnish you with some matter of conversation with the duchess and to enable you to reply in a suitable way to the chief reproaches she utters against me.'

"There was here a slight moment of repose and I took advantage of it to say:

"Will Your Majesty permit me to observe that my mission with the Duchess de Berry is absolutely a medical one, and that I have never considered and am not capable of any other kind.'

"Without doubt, Doctor, without doubt, and you shall not have to go beyond your functions.

"The resources of a doctor are not limited to his pharmacy. I wish to furnish you with means to bring about a salutary calm into the spirit of your patient.

"Listen, then, to me; your medical sagacity will permit you to readily understand the aid which you can draw from my words for the physical and moral amelioration of the Duchess de Berry.

"'My niece,' he went on to say (she was his wife's niece), 'is not stupid; she knows many things, but she has no idea what it means to be a constitutional monarch. She had had no occasion to find out; it will be, therefore, very useful to explain to her the necessity which dominates this new kind of royalty.

"'You must explain to the duchess that her actual destiny does not depend upon me and that I grieve as a kinsman over the troubles that beset her, but I cannot prevent them. You will tell her that a king is not free to do what seems to him best, that the state welfare (*raison d'état*) invoked by the minister is a law to which I must submit, however I may regret it on account of family ties.'

"The interview lasted five hours. Near the end, the king said: 'The queen would have liked to have seen you, Monsieur, and talked with you about the duchess, but you understand the shame that prevents her. The position of our niece violates all the instincts of a woman and a mother.'

"The king was referring to the general belief that the duchess was about to give birth to a child out of wedlock. Dr. Ménière at this point informed the king that the duchess had told him she was married, and he had every reason to believe it was true. The king said he was delighted to hear this and that the queen would be, also."

Dr. Ménière sets down his impression of the king—

"He appeared to me to be a truly remarkable man. His figure—in fact, his whole person—is strongly constituted, regular and expressive. He speaks while looking at you direct, with open, assured manner, without the least signs of embarrassment or hesitation. His speech is free and a little monotonous, but clear and penetrating. There was nothing to indicate previous preparation or striving after effect. He spoke without apparent effort and his ideas developed with ease and grace. I must say that the royal speaker had upon me a persuasive influence.

"His conversation, so natural and marked with the devel-

opment of many interesting points, gave me some idea of the difficulties of modern royalty and the anxieties of supreme power.

"It rests to be seen whether or not the royal captive at Blaye will succeed in overcoming my present conviction."

\* \* \* \*

The duchess was in due time delivered of a girl baby by the good graces of Dr. Ménière, and it was definitely established that she *was* married, her husband being an Italian nobleman, Count Lucchesi-Palli. When this fact became generally known, she completely lost the sympathy of the French people, and any chance she ever had that her little son, the Duke de Bordeaux, would become King Henry V was entirely lost. The government was in fact so relieved of all anxiety that it decided to release her from prison.

Dr. Ménière accompanied her to her home in Sicily and after a six months' tour of Italy, he returned to his practice in Paris, but from this time on, he seems to have been as much occupied with literary pursuits as with the practice of medicine.

As one of his admirers said, "Prosper Ménière was one of those untiring spirits who seeks no rest except in occupation of a different kind. An accomplished physician, a skilled operator, a botanist of reputation, he passed without effort and by the natural play of his faculties from one study to another—as from poetry to history, or from medicine to antiquarian research."

His literary activities were for the most part concerned with subjects connected with the science of medicine, or subjects of interest to medical men.

In 1837, he wrote an interesting paper entitled, "Medical Studies of Some Poets, Ancient and Modern."

In the following year he had published a much more ambitious work, a nearly 500-page volume entitled, "Medical Studies of the Latin poets." In this work he essayed to cull from

the early Latin classics everything they said of medical interest.

The Latins, unlike the Greeks or other peoples of the same periods, did not patronize doctors, and they were said to have existed two or three centuries without the benefit of professional practitioners. The science of medicine was included in general science; its practice was mostly in the hands of the more intelligent slaves. Ménière's research among such writers as Horace, Juvenal, Ovid and Virgil gives us a valuable guide to the household medicine as practiced in their day.

To our mind, however, the most interesting and most valuable of all of Dr. Ménière's literary works is his journal or diary, which deals with the peoples and events of his own time. It was published some years after his death by his son, under the title, "Anecdotes from the Salons of the Second Empire," and is a record of the conversation and stories of the great men of literature, science, art and politics of that era.

Ménière seems to have been a great favorite and friend of many celebrities in both literary and in governmental circles. That this was not altogether a result of contacts made in his royal mission, you may see from the following letter written to him by the great novelist, Balzac, on the occasion of his assuming that post:

"My dear Doctor:

"I am personally happy to hear of your being sent to Blaye, and politically satisfied that a man of honor and probity is chosen for the post.

"This I have already said to a number of persons and I take pleasure in confirming it. . . .

"Your conversation being habitually gentle, polite and instructive, it will not be difficult for you to please persons of taste. . . .

"That which I find best of all is that in this you can be of help in one of the most delicate positions that can happen to a woman.

(Signed) "De Balzac."

As already mentioned, Balzac eventually fell out with Dr. Ménière, it is said on account of the latter's intimacy with the distinguished critic, Jules Janin, whom Balzac much disliked.

We read in the diary that Dr. Ménière was dining one evening with the elder statesman, Pacquier, when the conversation turned to the subject of the Academy election.

"You observed that Alfred de Musset was not present on the last occasion," said M. Merimee. "Why?" asked M. Pasquier. Answer: "Because he was *absinthe*." The duke was much amused at this witticism and told of some of his own experiences with the distinguished dramatist.

Alfred de Musset, according to Ménière, had become so addicted to absinthe that he had reached the point of being a subject of disgust and could not be received in good company. It often happened that he would disappear for two weeks at a time; no one knew where he was, but finally he would be found in a low place at the cost of his dignity and of his reason.

One day when Saint-Beuve reproached him for his vicious habits, he replied, "It is true; but you, yourself, do you never go into such places?" "It is possible," replied the famous critic, "but I don't live there."

Sometimes the conversation would revert to the past—especially to the interesting Napoleonic era of which one of the older men could speak from personal knowledge. In this way, as Dr. Ménière remarks, some truth is brought out and some intimate details which the great writers do not deign to put in their solemn histories.

Pasquier, who was a counselor of state in Napoleon's cabinet, recounted some interesting things about Napoleon which he got direct from his physician, Dr. Corvisart. The Emperor had a great fear of poison and he sometimes questioned the Doctor very closely about the way in which one might recognize a poison in any food set before him. The Emperor was subject to attacks of pains in the stomach, and often on such occasion he would imagine himself poisoned and would push his fingers far back into his throat in order to provoke vomiting. When he could not vomit, he would lie down, roll over on the floor, lamenting and crying beyond measure, and he would send in a hurry for Corvisart.

When the Doctor arrived and found him in such a state, he would not hesitate to speak very roughly to him and to treat him roughly, too, and even push him with his foot. Yes, said the speaker, Corvisart used these very words, "*poussait de pied*" — in plain English, he kicked him. Get up, said the Doctor; it is shameful, it is cowardice. You have nothing but cramps in the stomach. And the Emperor would get up and in time become calm.

Corvisart is said to have been the only person who could speak so frankly to the Emperor, who, nevertheless, had great respect and great friendship for him.

He is remembered in medical history as the man who revived and popularized percussion as a method of examination of the chest. He translated into French the forgotten brochure by Auenbrugger on the subject.

We have been led to this study of Dr. Prosper Ménière despite the fact that while his name is so widely used, he, himself, is so little known. There have been conflicting reports about his sponsorship of the disease named after him, and besides there have been objections to the use of this name.

Dr. Ménière never suggested, himself, that the disease should be named for him, nor did he suggest that it be called a new disease. This was the result of the comments of those who came after him.

What Ménière did was to show that a new group of symptoms which had previously been regarded as certain evidence of disease of the brain was due instead to a lesion from the internal ear. In doing this he saved many patients from a course of drastic purging and bleeding, which was the usual treatment for such cases in his day.

We, as otologists, should especially honor him for being the first to direct attention to the ear as a source of these severe general symptoms. He was the real father of the now generally recognized labyrinthine vertigo.

Of the man himself, it must be said that the more we know

of him, the more apparent it becomes that Dr. Mérière measures up to the very best traditions of our profession.

He was clearly a man of culture and wide interests; a physician who possessed not only skill, but learning; not only learning, but ability; and not only ability, but character. He well deserves the fame his eponym has brought him.

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#### MISSISSIPPI VALLEY MEDICAL SOCIETY 1947 ESSAY CONTEST.

The Seventh Annual Essay Contest of the Mississippi Valley Medical Society will be held in 1947. The Society will offer a cash prize of \$100.00, a gold medal and a certificate of award for the best unpublished essay on any subject of general medical interest (including medical economics and education) and practical value to the general practitioner of medicine. Certificates of merit may also be granted to the physicians whose essays are rated second and third best. Contestants must be members of the American Medical Association who are residents of the United States. The winner will be invited to present his contribution before the Twelfth Annual Meeting of the Mississippi Valley Medical Society to be held at Burlington, Iowa, Oct. 1, 2, 3, 1947, the Society reserving the exclusive right to first publish the essay in its official publication—the *Mississippi Valley Medical Journal* (Incorporating the *Radiologic Review*). All contributions shall be typewritten in English in manuscript form, submitted in five copies, not to exceed 5,000 words, and must be received not later than May 1, 1947. The winning essays in the 1946 contest appear in the January, 1947, issue of the *Mississippi Valley Medical Journal* (Quincy, Ill.).

Further details may be secured from Harold Swanberg, M.D., Secretary, Mississippi Valley Medical Society, 209-224 W. C. U. Building, Quincy, Ill.

REPORT OF TWO CASES:

(1)—CAVERNOUS SINUS THROMBOSIS FOLLOWING  
TOOTH EXTRACTION.\*

(2)—CARCINOMA OF THE LARYNX.  
CLINICAL REPORT OF CASE—AGE 13½ YEARS.

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CAVERNOUS SINUS THROMBOSIS FOLLOWING  
TOOTH EXTRACTION.

HENRY BOYLAN ORTON, M.D.,  
Newark, N. J.

In looking through the *Transactions* of the American Laryngological, Rhinological and Otological Society, Inc., the reports of cases of cavernous sinus thrombosis have not been too frequent.

It is a recognized fact that thrombosis of the cavernous sinus follows infections of the face, nasopharynx, sinuses, teeth, ear and the neck. Knowing the site of entrance of the infection is of the utmost importance.

A case is herewith presented with the clinical picture of cavernous sinus thrombosis, following the extraction of the third upper right molar; the course of the infection being through the pterygoid plexus into the cavernous sinus by way of the foramen ovale, with the formation of the thrombose involving the IIIrd, IVth, Vth and VIth nerves.

The diagnosis of cavernous sinus thrombosis must rest on:

1. The known site of infection.
2. Blood stream infection.
3. Early but slight symptoms of obstruction, temporary fullness of the retinal veins and ocular edema.

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4. By inflammatory edema or pressure of the nerves in the sinus, causing paralysis of the IIIrd, IVth and Vth nerves, and paresthesia or anesthesia of the ophthalmic division of the Vth.

Without going too deeply into the anatomy, the cavernous

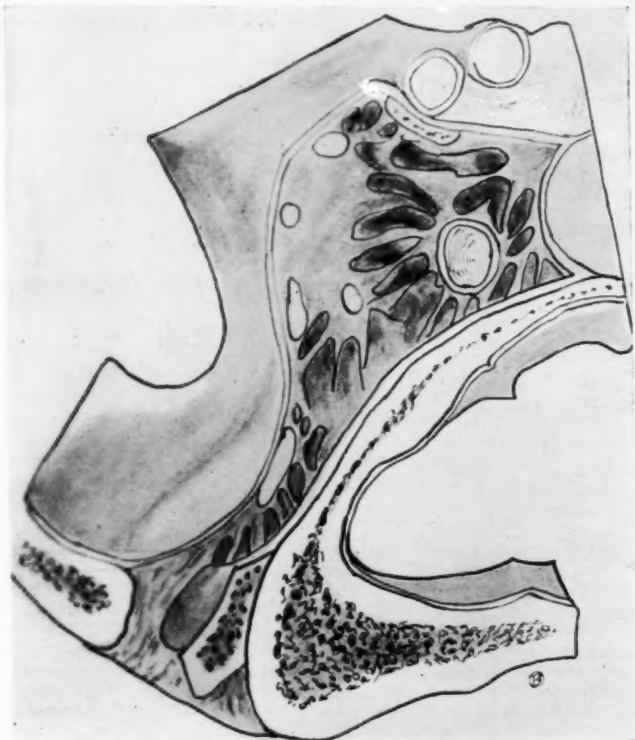


Fig. 1. Pen sketch showing cavernous sinus.

sinus lies at the side of the body of the sphenoid bone, the lumen is crossed by strands of connective tissue which divide the sinus into many compartments containing the internal carotid artery, the oculomotor trochlear, the maxillary and ophthalmic divisions of the trigeminal and the abducent

nerves. Pterygoid plexus is located in the infratemporal fossa, covers the surface of the medial pterygoid and surrounds the lateral pterygoid muscles. It receives the sphenopalatine, pharyngeal, infraorbital, posterior superior dental, greater palatine, buccal, deep temporal, pterygoid, masseteric veins to the plexus, and it communicates by emissary vein with the cavernous sinus through the foramen ovale.

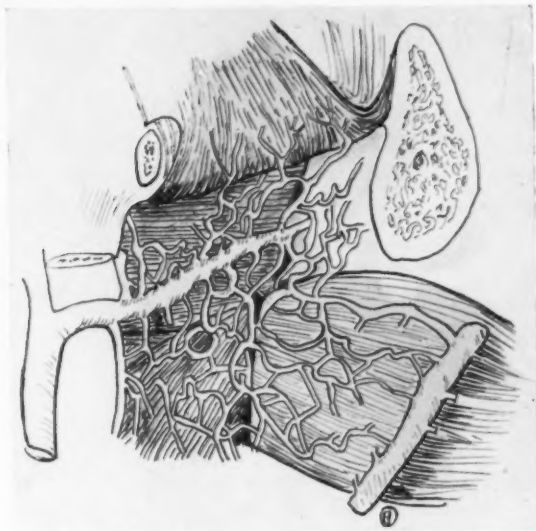


Fig. 2. Pen sketch showing pterygoid plexus.

*Report of Case:* C. R., white, male, aged 39 years, was admitted to the Presbyterian Hospital on March 18, 1945, acutely ill, with a temperature of 106.2°. The following history was obtained: One week previous, the patient had his third upper right molar extracted under local anesthesia. Three days following this extraction, he began to have pain in that area, which gradually increased with noticeable swelling. This swelling increased so rapidly in the next two days that the entire right side of his face was swollen. He had had two chills prior to his being admitted to the hospital.

A blood count made at the time of patient's admission to the hospital showed a hemoglobin of 74 per cent; erythrocytes, 4,010,000; slight anisocytosis; color index, 0.9; leucocytes, 15,800; neutrophils, 81; band forms, 18; segmented forms, 73; lymphocytes, six; monocytes, three. Morphine was necessary to control the pain, and the patient was immediately given penicillin and sulfonamides.

The next day, March 19, the swelling extended on the right side from

the top of his head to the neck, with beginning swelling of the upper lid on the same side. There was also considerable swelling on the inside of his mouth above the area where the tooth had been extracted. This was very painful, and the patient had great difficulty in opening his mouth, probably due to the involvement of the pterygoid muscle. Fluctuation was noticed in the temporal region, and realizing that infection from this area travels upwards, the patient was taken to the operating room, and under local anesthesia an incision was made just below the hairline in front of the ear on the right side longitudinally through skin and temporal fascia, and a small amount of pus was evacuated. The report of the culture was nonhemolytic and staphylococcus albus. At the same time this incision was done a counter-opening was made in the mouth and extending backwards into the pterygoid region and a through-and-through drain inserted.

On March 20 the temperature was of a picket fence type, with upper limits of 106.6°. Patient was irrational at times, with mutterings and twitchings, and picking of the bed clothes. He had a chill, followed by profuse perspiration, and a blood culture taken at this time was negative for any growth. The pain in his head and neck was very severe. Patient vomited a small amount of fluid. These findings showed evidence of meningeal involvement, but no spinal puncture was made at this time, awaiting further report of blood culture. He was given intravenous glucose of 5 per cent with 50,000 units of penicillin in each 1,000 cc., plus 30 gr. of sulfadiazine every four hours.

Examination of the eyes showed no papilledema, but the vessels were engorged and the patient was complaining of pain radiating from the right to the left eye. His general condition was poor.

March 21: Patient was very restless, talking incoherently, picking at dressings, and irrational. The same day he had a chill which lasted about 20 minutes. Patient expectorating large amounts of thick, yellowish pus drainage.

March 22: The right eye was markedly swollen, with chemosis, anesthesia of cornea, and almost impossible to open his lids to view the fundus. Lips and nails cyanotic.

Examination of the mouth showed some swelling of the lateral pharyngeal wall, and after consultation with Dr. John Bissett, the patient was taken to the operating room and, under local anesthesia, the pharyngomaxillary space was opened through the submaxillary area, and the carotid sheath was also laid bare. This wound was left open and a penicillin dressing was laid over it.

March 23: Patient had another chill, with temperature of 103.2°, was lethargic and listless, and 500 cc. of citrated blood transfusion were given.

Since all the blood cultures up to this time were negative, we decided to do a spinal puncture; this was done with a cell count of 547. Globulin increased, and 50,000 units of penicillin given intraspinally, and 60 gr. of sulfadiazine to be followed by 30 gr. every four hours by mouth with bicarbonate of soda. Patient was still very listless, constantly picking the bed clothes and talking incoherently. Another 50,000 units of penicillin were given intravenously. The left eyelid still edematous. Blood count taken on this day showed 68 per cent hemoglobin; erythrocytes, 3,050,000; leucocytes, 7,400. A trace of albumin was noticed in the urine. Sulfadiazine determination was 11.2 and the cell count of the second spinal tap showed 1,414. Pulse irregular. Later that evening patient became more cooperative. His face appeared to be less swollen; 6 cc.

of penicillin given intraspinally. The wounds were dressed twice a day and penicillin solution applied to the dressings.

March 24: General condition of the patient seems to be improved, temperature  $102^{\circ}$ , less swelling of the face. Sulfadiazine and penicillin were continued, and another transfusion was given.

March 25: A spinal puncture was made and 6 cc. of penicillin given intraspinally. Patient sleeping most of the time. Some swelling was noticed on the left side of the face. That evening another spinal tap was done and penicillin given intraspinally, and also 1,000 units of penicillin to every 1,000 cc. of glucose were given intravenously.

March 26: Patient seemed to be a little more alert. At this time he began to have some difficulty in passing urine and it was necessary to catheterize. The cell count of the spinal fluid on this date was 208.

March 27: The same treatment being continued. Spinal count was 392 cells. The patient's foot and ankle became swollen. Sulfadiazine determination was 12.8. At this time sulfadiazine dosage was discontinued. Spinal tap taken at this time showed a cell count of 184.

March 28: A blood transfusion was given and the temperature had dropped to  $100^{\circ}$ , and from this time on, the temperature gradually came down to normal.

March 29: The optic discs were indistinct, vessels engorged — no Kernigs.

April 1: Complained of double vision which showed involvement of the trochlear nerve. At this time a weakness of the right external rectus was noticed.

April 4: Eye examination showed the paralysis of the right external rectus is more marked. Margins of both optic discs are indistinct, and the vessels are engorged.

April 7: Temperature was normal; the patient continued to improve and he was discharged from the hospital April 29—43 hospital days.

From that time on, the patient's eyes improved gradually, and I last saw him on Nov. 5, 1946, at which time his vision was perfect and he had no complaints.

During his course of treatment he had received four transfusions. Total dosage of penicillin was 6,220,000 units. Sulfadiazine was 200 gm., or approximately seven ounces.

*Summary:* Reporting a case of cavernous sinus thrombosis following infection from tooth extraction. Pathway of infection going through pterygoid plexus to cavernous sinus. Causing paralysis of ocular motor, trochlear, abducent, ophthalmic and maxillary division of the trigeminal nerves.

Massive doses of penicillin totalling 6,220,000 units and sulfadiazine totalling 205 gm., or almost seven ounces. Four transfusions were given. The various spaces—pharyngomaxillary, pterygoid maxillary and carotid—laid open. Suppression of urine from sulfadiazine, and recovery with eye function normal.

**CARCINOMA OF THE LARYNX.**  
**CLINICAL REPORT OF CASE—AGE 13½ YEARS.\***

HENRY BOYLAN ORTON, M.D.,  
Newark, N. J.

Cancer of the larynx occurring in the second decade of life is rare; this, in itself, is of sufficient importance to warrant the reporting of the following case.

R. M. S., boy of six and one-half years, was referred to me by the family physician on June 7, 1935, for the removal of his tonsils. Family history was negative for any hereditary disease. Previous illnesses of the patient were chickenpox and measles.

On examination, the nasal cavities were negative, tonsils were hypertrophied, with a fair amount of adenoid tissue in his nasopharynx. Larynx was negative for any growth, and the voice was that of a normal six-and-one-half-year-old boy. The patient had his tonsils and adenoids removed June 15, 1935, at the Presbyterian Hospital; the operation was uneventful, as well as the postoperative period.

Following this, I did not see the patient again until Oct. 19, 1942, seven years later, when he was 13 and one-half years of age. At this time, he consulted me in my office, complaining of a sore throat of two weeks' duration; the patient giving as the cause, gagging on some popcorn kernels that he had been eating. The mother of the patient then volunteered the following information: In February or March, 1940, the patient had a sore throat and swelling of the glands on the right side of his neck, with a temperature, and was very sick. He was taken to a hospital in a neighboring city and treated with sulfanilamide. The patient recovered from this condition, but the glands in the neck still remained enlarged, especially on the right side. The mother had noticed a change in her son's voice in August, 1942, but paid little attention to it, thinking this was perfectly normal, considering his age. She also stated that on Aug. 15, while eating popcorn, he had a choking spell, and had a sensation of something sticking in his throat, which caused coughing at times. He had no trouble breathing or eating his meals. One month later, in September, 1942, he experienced some difficulty in swallowing citrus fruits; this continued until Oct. 3, when at this time the patient began running a temperature, breathing became difficult, glands of the neck becoming enlarged, with accompanied pain in the right ear. This condition continued to become worse, the dyspnea progressing to such a degree that the patient could not lie down.

At the time of this examination, Oct. 19, 1942, temperature was normal; ears were negative for any pathology, and the pain complained of in the right ear was of reflex origin from the right side of the throat. Nose and pharynx were negative.

Laryngoscopic examination of the larynx showed a large granular growth, papillomatous in character, involving both arytenoids, with an ulceration of the right arytenoid with cartilage exposed. This growth

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was so large that it almost completely closed the chink of the glottis. A very noticeable odor was present. There was a large fixed mass of glands on the right side of the neck just before the angle of the jaw, also some on the left side. With this picture, my notes stated that if the patient were older I would think of malignancy, and I so informed the mother. Urine and Wassermann were negative.

Arrangements were made to do a direct laryngoscopy with biopsy from both sides of the larynx, and a tracheotomy, which was urgent. All this was done on Oct. 21, inserting a No. 4 tracheotomy tube. The report of the biopsy showed an ulcerating papillary growth composed of spindle shaped cells and vascular cores, with atypical elongated cells in nest invading the submucous tissue; diagnosis—ulcerating papillary carcinoma, Grade II, right cord, and Grade I, left cord. This pathological



Fig. 1. Pen sketch of larynx showing large granular growth, papillomatous in character, involving both arytenoids, before irradiation therapy.

diagnosis of carcinoma actively malignant, was confirmed by the pathological laboratory at Jefferson Medical College.

Chest, skull and long-bone X-rays taken Oct. 23 show "the bony framework to be apparently normal. The lung fields are clear, but the hilus shadows are hazy and indistinct as outlined. The diaphragms are at normal levels and the costophrenic angles are clear. The heart shadow is not enlarged. Summary: The only Roentgen evidence of any pathology is the appearance of the hilus shadows, which is suggestive of either bronchitis or some upper respiratory infection. A single scout film of the sinuses did not show any evidence of pathology." (Dr. James Marquis.)

With the above picture of a rapidly growing malignancy, with glandular involvement, operation was not advisable, and the patient was dis-

charged from the hospital and referred to Dr. Joseph Wyatt on Nov. 14, 1942, for deep X-ray therapy.

Three weeks later, on Dec. 5, examination of the larynx showed considerable regression of the growth. The left side of the larynx was remarkably improved, and the swelling on the right side smaller.

On Dec. 12, the left side of the larynx was very much better, and the right side still smaller than at the time of his previous visit.

On Jan. 9, 1943, the laryngological examination showed the growth had entirely disappeared on the left side of the larynx. The right side was considerably smaller, but still present.

Feb. 25, there was some edema of the epiglottis and right arytenoid, due to X-ray therapy. The glands in the neck were still firm. The patient at this time complained of some pain in his right knee. X-rays taken of the knee and chest showed the chest to be negative. "The



Fig. 2. Pen sketch of larynx, showing the left side entirely free of growth, and the right side considerably improved, following irradiation therapy.

right knee revealed a gouged out appearing area of bone destruction involving the outer portion of the proximal end of the diaphyses of the tibia, and extending into the shaft through the midline. This is undoubtedly metastasis of the lesion in the larynx." (Wyatt.)

No improvement was noticed from the above date, and on April 2 the patient found it necessary to use a cane or crutch to walk about. The gland on the right side of the neck increased to the size of an orange. He had severe pain in his shoulder, back and buttocks. Two weeks later, patient had difficulty retaining anything on his stomach, and on May 11 he had a convulsion which involved the left face, arm and leg. At this time a number of poliomyelitis cases were being reported from his neighborhood, and this was ruled out following examination.

Blood count: Hemoglobin, 74 per cent; erythrocytes, 3,920,000; color index, 0.94; leucocytes, 20,300; polymorphonuclears, 90 per cent; eosinophile, 0 per cent; basophile, 0 per cent; lymphocytes, 7 per cent.

Shilling Index: Young forms, 0; band forms, 12; segmented forms, 78; shift to the left anisocytosis. Spinal fluid, 8 cc., clear, colorless fluid, not under pressure. Cells, three per cm. Globulin not increased. Sugar, 42 mg. per 100 cc.



Fig. 3. Showing X-ray of right knee revealing a gouged out appearing area of bone destruction, involving the outer portion of the proximal end and extending into the shaft of the tibia.

From this date, patient's condition became progressively worse, and on May 18 he became semiconscious. From May 18 to May 29 he had five convulsions; became unconscious on May 29, and expired two days later.



*Summary:* Reporting a case of primary carcinoma of the larynx in a boy 13 and one-half years of age, with metastasis to glands of the neck, bones and brain.

224 Delavan Avenue.

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#### PILLING PRODUCES NEW INSTRUMENTS OF STAINLESS, DURABLE "BRONCALLOY."

A major advance in the manufacture of endoscopic instruments is announced by George P. Pilling & Son Company, Philadelphia instrument makers since 1814. Now, certain instruments formerly produced only of brass, are manufactured of a stainless, durable metal, "Broncalloy."

These new instruments were introduced to the medical profession at the recent joint meeting in Chicago of the American Academy of Ophthalmology and Otolaryngology and the first Pan-American Congress of Oto-rhino-laryngology and Broncho-esophagology, and were greeted with widespread enthusiasm.

"Broncalloy" instruments have the advantage of far greater strength and rigidity without appreciable sacrifice of the diameter of the lumen. Greater rigidity of the bronchoscopes facilitates their introduction into the larynx without the laryngoscope and aids in complete lumen exposure of the upper lobe bronchi. Being practically indestructible and corrosion-resistant, they will require a minimum of repairs. Despite these superior features, the cost of "Broncalloy" instruments is only fractionally higher than that of instruments made of softer metal.

"Broncalloy" instruments now available include bronchoscopes, esophagoscopes, suction tubes, sponge carriers, cannulated forceps, etc., as designed and used by other recognized authorities.

### RESEARCH AWARD OF A. P. M. A.

The new annual Research Award of the American Pharmaceutical Manufacturers' Association was presented for the first time at the fortieth annual meeting on April 28 at the Boca Raton Club, Boca Raton, Fla. Dr. Bernardo Alberto Houssay, of Buenos Aires, Argentina, was named as the first recipient.

This new award, which will henceforth be presented every year at the association's annual meeting, is in addition to A. P. M. A.'s Scientific Award which is presented annually at the winter mid-year meeting.

The basis of the Research Award as well as its time of presentation differs from that of the Scientific Award. The new award was established to recognize the work of an individual research investigator who during the recent past made an outstanding and significant research contribution in the field of medicine or the medical sciences. The Scientific Award, on the other hand, recognizes a fundamental contribution to public health through continuing research in the medical sciences and usually goes to a research group or institution.

This advisory committee submits a list of nominees to the A. P. M. A. Research Board, whose chairman is Dr. Theodore G. Klumpp, president of Winthrop Chemical Co. The selection is made from this list by the research board and submitted to the association's board of directors for final approval.

Any scientist in any part of the world in any position is eligible for consideration. The recipient of the Research Award may be a research worker who is outstanding in the field of medicine, chemistry, physics, bacteriology, physiology, pharmacology, pharmacy, anatomy, pathology or any one of the other clinical sciences or specialties in the field of medical sciences.

The Research Award of the American Pharmaceutical Manufacturers' Association is, therefore, one of international significance and a truly high scientific honor. To symbolize this honor, the award will take the form of an engraved watch, accompanied by a parchment scroll.

